

PATENT CLAIMS

1. A method for patterning a polymer film forming a coating on a material surface, wherein the patterning takes place by means of a stamp having a surface with at least one indentation formed therein, characterized by depositing onto the material surface a thin film of polymer, applying to the material surface the stamp made of an elastomeric material in conformal contact with the surface of the thin film, such that portions thereof contacting one or more protruding elements of the elastomeric stamp formed by the at least one indentation thereof are attached to the protruding element or elements and removed from the material surface with the stamp.
2. A method according to claim 1, characterized by modifying the polymer film by incorporating additives in order to reduce the cohesive binding of the polymer film.
3. A method according to claim 2, characterized by an additive being a water-soluble organic compound.
4. A method according to claim 2, characterized by an additive being selected among ethylene glycol, poly(ethylene glycol), glycerol, sorbitol, polyol, or any combinations thereof.
5. A method according to claim 1, characterized by the polymer being a water-soluble or dispersed polymer.
6. A method according to claim 1, characterized by the polymer being a conducting conjugated polymer in its doped or undoped state.
7. A method according to claim 1, characterized by the polymer being poly(3,4-dioxyethylenethiophene) (PEDOT) or deriving from a copolymer thereof or one or more mixtures incorporating the monomer (EDOT) form.
8. A method according to claim 1, characterized by modifying the material surface in order to provide a weak adhesion between the material surface and the polymer film to be removed therefrom.

9. A method, according to claim 8, characterized by modifying the material surface by plasma etching.
- 5 10. A method according to claim 1, characterized by modifying the elastomer stamp surface in order to provide a strong adhesion between the stamp and the polymer film to be attached thereto.
- 10 11. A method according to claim 9, characterized by modifying the elastomer stamp surface by plasma etching.
12. A method according to claim 1, characterized by enhancing the adhesion between stamp and the polymer film by means of additives to the latter.
- 15 13. A method according to claim 12, characterized by an additive being glycerol.
- 20 14. A method for transferring a patterned polymer film onto a material surface by means of a stamp having a surface with at least one indentation formed therein, characterized by depositing onto the stamp surface a thin film of polymer, applying the stamp made of an elastomeric material in conformal contact with the material surface, such that the thin film of polymer is transferred thereto from one or more protruding elements of the elastomeric stamp formed by the at least one indentation thereof, and leaving a patterned
- 25 thin film of polymer on the material surface when removing the stamp therefrom.
- 30 15. A method according to claim 14, characterized by modifying the polymer film by incorporating additives in order to reduce the cohesive binding of the polymer film.
16. A method according to claim 15, characterized by an additive being a water soluble organic compound.
- 35 17. A method according to claim 15, characterized by an additive being selected among ethylene glycol, poly(ethylene glycol), glycerol, sorbitol, polyol, or any combinations thereof.

18. A method according to claim 14, characterized by the polymer being a water-soluble or dispersed polymer.
- 5 19. A method according to claim 14, characterized by the polymer being a conducting conjugated polymer in its doped or undoped state.
20. A method according to claim 14, characterized by the polymer being poly(3,4-dioxyethylenethiophene) (PEDOT) or deriving from a copolymer thereof or one or more mixtures incorporating the monomer (EDOT).
- 10 21. A method according to claim 14, characterized by modifying the elastomer stamp surface in order to provide a weak adhesion between the elastomer surface and the polymer film to be removed therefrom.
- 15 22. A method according to claim 21, characterized by modifying the elastomer stamp surface by plasma etching.
23. A method according to claim 14, characterized by modifying the material surface in order to provide a strong adhesion between the material surface and the polymer film to be transferred thereto.
- 20 24. A method according to claim 23, characterized by modifying the material surface by plasma etching.
- 25 25. The use of a method according to ^{claim 1}~~claims 1 or 14~~ to provide a patterned etch resist in the form of a thin film of polymer on a gold layer, whereby the gold layer can be removed by etching of the area unprotected by the resist, the polymer preferably being PEDOT.